DVIDEC100

4x1 DVI SWITCHER & HIGH RESOLUTION SCALER

- **4 selectable DVI inputs with associated audio**
- **“Through Blank” switching on DVI output**
- **Seamless switching with fading on RGB output**
- **Selectable RGB analogue format in output**
- **Maintenance of settings**
- **Optional remote control**
- **Can be controlled via RS232**
- **Possibility of cascade**
- **Autoswitching, autosequencing and mute**

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INSTALLATION AND USE OF THE DVIDEC100

INDEX:

When installing the DVIDEC100 unit, please read this booklet carefully.

The manufacturer shall not be held responsible for any damage or injury caused by use, even correct, of its products.

Product data and characteristics may be modified without prior notice.

1.0 OVERVIEW

Thank you for choosing our product. Check the contents of the packaging. It contains:

Instructions manual and Conformity certificate

Mains cable

IR remote control (OPTIONAL)

The DVIDEC100 unit routes DVI-D video signals present on the four input channels to a DVI-D output and to a high resolution RGB output on which it is possible to select resolution from SVGA to SXGA. The Y,Cb, Cr format progressive from 480p to 1080i is also available.

The possibility of selecting between four (or more in the case of cascade) input signals, each with associated audio, makes the DVIDEC100 very useful in presentation environments where several information sources must be displayed on a single device. Conversion into RGB format makes it possible to work with DVI quality on VGA cables overcoming the restrictions imposed by the length of the DVI cables. A special circuit guarantees EDID connection towards the destination even with source not selected, preventing switch-off of the source.

The DVIDEC100 unit performs switching with blanking on the DVI output and seamless switching with fading on the RGB output. This solution makes it possible to avoid the troublesome effects of LCD devices on switching of a signal on their input.

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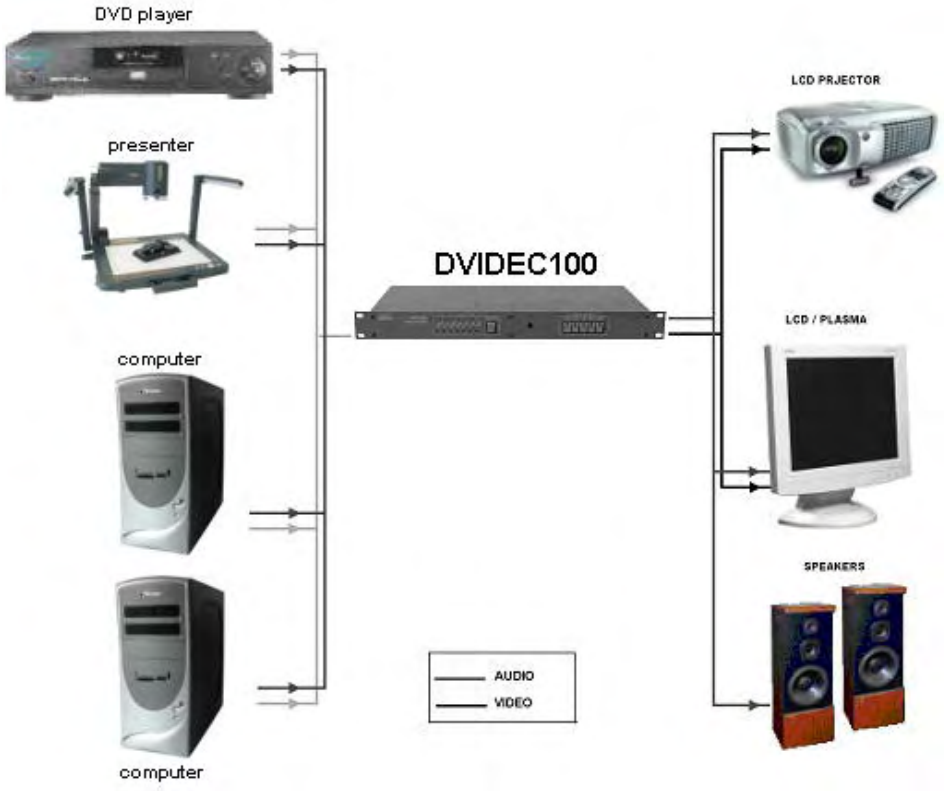
The audio output that, in switching, follows the DVI input selected is both balanced and unbalanced.

For details of functioning of the IR remote control, see chap. 7.0

For the data exchange protocol via RS232, refer to chap. 8.0



2.0 POWER SUPPLY

The DVIDEC100 unit must be powered with an ac voltage of 90÷240V 50/60Hz using the cable provided. The plug of the cable must be inserted in the related panel plug on the left of the back of the unit.

The panel plug is fitted with a fuse-holder for 5X20 fuses. If the fuse blows, replace with a fuse **with the same rating** as specified on the back of the unit .

All operations must be carried out by qualified personnel only who must be informed of the risks of electric shock

In some countries, the plug of the cable must be adapted to align this local standard types. The wires are identified according to the following coding:

- Brown PHASE (Identified with the letter L, may be red)
- Blue NEUTRAL (Identified with the letter N, may be black)
- Yellow/Green GROUND (Identified with the letter E, may be green)

WARNING
A ground connection is mandatory

3.0 SETTINGS

The DVIDEC100 unit does not have any internal presets to be made by the user.

Certain pre-settings can be made directly from the keyboard (See chap. 6.3) or using the dip-switch on the back (See chap. 9)

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4.0 INSTALLATION

4.1 Video signals

Connect the **DVI** sources to the DVI IN connectors on the back of the unit using not more than 15-m long cables

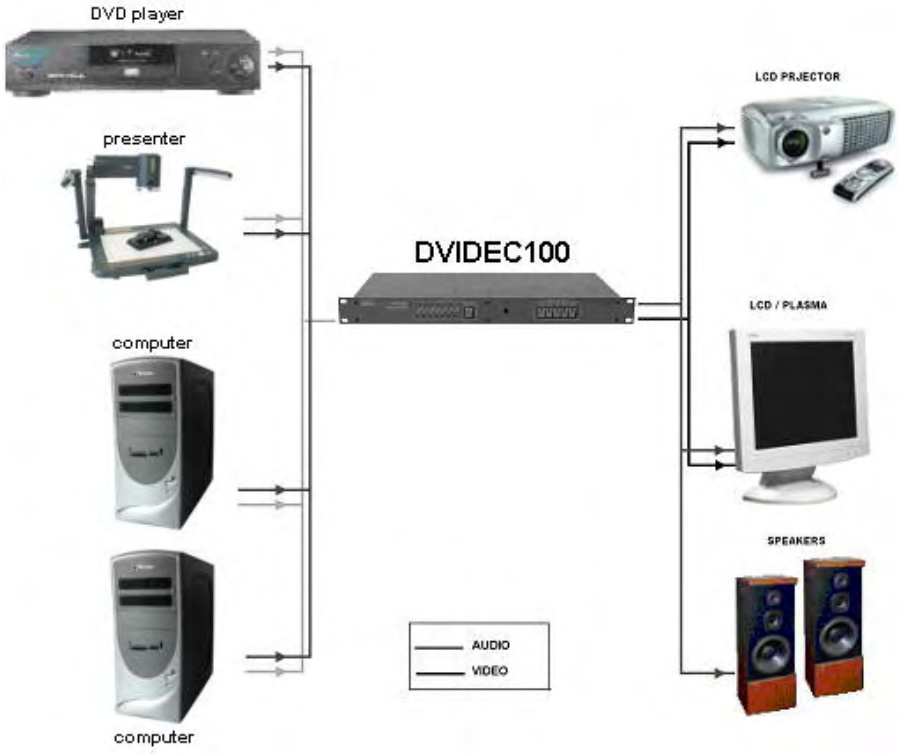
WARNING

The DVIDEC100 does not accept sources containing the HDCP protection protocol. Analogue signals present on DVI-I connector are not managed

Connect the DVI-D destination (Video-projector or plasma or TFT monitors) to the DVI OUT output. Connect the RGB destination ((Video-projector or plasma or TFT monitors) to the VGA OUT output

WARNING

It is advisable to use Elpro DVI and VGA cables in order to exploit the characteristics of the compensation circuit of the DVIDEC100



4.2 Audio signals

Connect the audio of all the sources to the stereo RCA inputs identified as AUDIO INPUTS. The DVIDEC100 has two audio outputs: one balanced and one not balanced. The audio signal is the same on both outputs. Connect the unbalanced audio output to its destination (usually a VHS recorder). Connect the balanced audio output to a set of active speakers or a stereo amplifier.

WARNING
If the loudspeakers or amplifier have the input unbalanced, use outputs "a" and GND leaving free output "b". In this case, half of the output level is lost.

5.0 AUXILIARY FUNCTIONS

5.1 AUTOSEQUENCING

All 4 inputs are switched to the outputs at a rate of 4 seconds. This function is identified by fast flashing of the resolution led.

5.2 AUTOSWITCHING

The active source is displayed on the outputs. If several sources are active at the same time, source 1 has the highest priority followed by 2 and so on. This function is identified by slow flashing of the resolution led.

5.3 MUTE

No video and audio source is switched on the outputs. If this function is active, this is indicated by flashing of the led incorporated in the key of the input selected.

WARNING
Autosequencing, Autoswitching and Mute are mutually exclusive. Priority is 1st MUTE - 2nd AUTOSWITCHING - 3rd AUTOSEQUENCING
With the CASCADE option, the AUTOSWITCHING function is excluded

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6.0 LOCAL CONTROL

6.1 Input selection

The input to be converted/switched is selected pressing one of the four INPUT SELECT. keys
The led ON indicates which input is selected at that moment. Also, a light flashing in the background indicates the channel on which an active DVI-D signal is present.

6.2 Resolution of the output signal

The resolution of the output RGB signal is set pressing the RESOLUTION / SELECT button. The active resolution is displayed by the led ON and remains saved even after subsequent power-ons.

6.3 Settings from keyboard

a)Preset of input at power-on

b)The input to be sent in output at power-on can be saved: press the button of the input selected for 3 seconds. Continuous flashing of the built-in led indicates that the command has been saved.

The default unit enables input 1

b) IR receiver activation/de-activation

the IR receiver can be disabled or re-activated holding down simultaneoulsy the DV1 and DVI4 keys on switching on the machine.

7.0 FUNCTIONS WITH IR REMOTE CONTROL

The unit features an IR remote control which must be purchased separately.

WARNING

The remote control is of the self-teaching type. After inserting the batteries and each time these are changed, press the "Set" key for a few moments followed by the key with the violet edge (button # 6)

The following functions, divided into 8 groups, are performed using the 28 keys of the IR remote control:

1st Group - 1 key: SELF-TEACHING

Set + key CH6 Self-teaching of the remote control each time the batteries are replaced.

2nd Group - 2 keys: SAVE AND RECALL

Save save all current presets

Recall recall presets saved previously with SAVE.

3rd Group - 1 key: DEFAULT

DEFAULT Restore all standard conditions of the unit.

4th Group - 11 keys: **INPUT SELECT**

Press the key of the input to be converted/switched. The input selected is identified by the led built into the related button on the console. For single units, only keys 1 to 4 are active: for units in cascade, keys 1 to 9 are active; to select an input above 9, press the ">" key followed by the two keys that identify the input**.**

5th Group - 4 keys**: ON SCREEN DISPLAY**

Use the 4 keys **+**, **-**, **PICT** and **MODE** for use of the OSD on VGA output.
PICT: accesses the Brightness, Contrast, Saturation, Sharpness menus
MODE: accesses the Resolution, YCbCr, H Pos, V Pos menus
With the + and – keys, operations are performed on the menus selected

6th Group - 1 key: RESOLUTION

RESOLUTION Sets the format of the signal on the high resolution output. The format set is displayed by the leds on the console of the DVIDEC100.

7th Group - 6 keys: **MUTE, AUTOSWITCH, AUTOSEQUENCING**

Press MUTE ON to activate the Mute function
Press ASEQ ON to activate the AutoSequencing function
Press ASW ON to activate the AutoSwitching function
Press the related OFF keys to restore

8th Group - 2 keys : **FINE Freq + and FINE Freq –** (Not indicated in the screen printing)
Use these keys for fine adjustment of the output frequency of the scaler and to optimize Image quality in particular on LCD.

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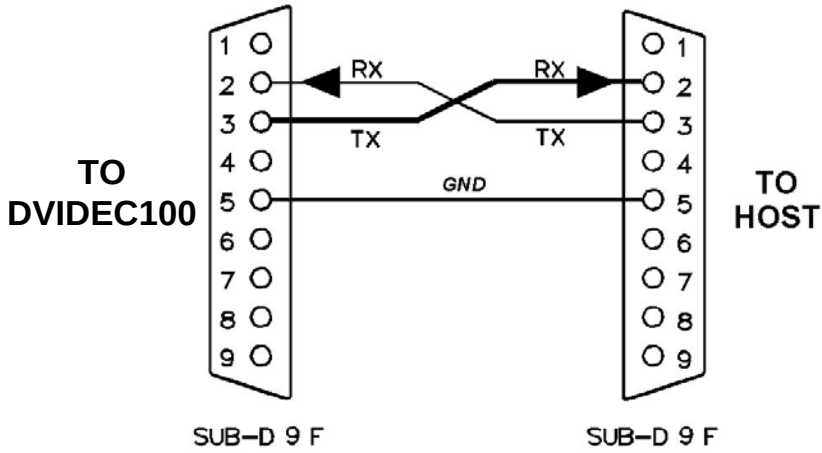
8.0 CONTROL BY COMPUTER via RS232

On its site www.elprovideolabs.com, Elpro has made available a software running under Windows suitable for controlling the DVIDEC100 via RS232.
If the user intends to develop personalized software, the RS232 protocol to be implemented is available on the same site.(This user manual).
All functions of the DVIDEC100 scaler can be controlled through transmission/reception from computer of strings of hexadecimal and ASCII characters.

The procedure for data exchange via RS232 is as follows:
Transmission standard: 8 data bits, no parity, 1 stop bit and speed of 9600 baud.

8.1 Physical connection
Physical connection must be afforded using a cable according to the diagram below:



8.2 Video and audio input selection command.
The host must send the following sequence
BXX followed by **CR** where: B is the hex character 42
XX is the video/audio input (from 01 to 04)
Example: to select input 1 send the following characters on line: 42 30 31 0D
The scaler DVIDEC100 replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

8.3 Setting of mute audio and video

The host must send the following sequence

mX followed by **CR** where m is the hex character 6D
X indicates mute status (0 or 1)
0 indicates mute off
1 indicates mute on

Example: to activate muting, the following characters must be sent on line: 6D 31 0D
The scaler DVIDEC100 replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

8.4 Setting of autoswitching

The host must send the following sequence

wX followed by **CR** where w is the hex character 77
X indicates autoswitching status (0 or 1)
0 indicates autoswitching off
1 indicates autoswitching on

Example: to activate autoswitching, the following characters must be sent on line: 77 31 0D
The scaler DVIDEC100 replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

8.5 Setting of autosequencing

The host must send the following sequence

qX followed by **CR** where q is the hex character 71
X indicates autosequencing status (0 or 1)
0 indicates autosequencing off
1 indicates autosequencing on

e.g.: to activate autosequencing, the following characters must be sent on line: 71 31 0D
The scaler DVIDEC100 replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

8.6 Setting of YPbPr

The host must send the following sequence

aX followed by **CR** where a is the hex character 61
X indicates YPbPr mode status (0 or 1)
0 indicates YPbPr off
1 indicates Y PbPr on

e.g.: to activate YPbPr format on the RGB output the following characters must be sent on line: 61 31 0D
The scaler DVIDEC100 replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

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8.7 Setting of output resolution

The host must send the following sequence

fX followed by **CR** where f is the hex character 66
X indicates the resolution of the output (from 1 to 7)

1 format SVGA	2 format XGA	3 format SXGA	4 format 480p
5 format 576p	6 format 720p	7 format 1080i	

e.g.: to set the SXGA output format, send the following characters on line: 66 33 0D
The DVIDEC100 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

8.8 Save settings

The current status of the DVIDEC100, i.e. the input selected, the resolution of the output, image regulation parameters (brightness, contrast, saturation, sharpness) is saved in the non-volatile memory. The mute condition is not saved.

The host must send the following sequence
S followed by **CR** where S is the hex character 53
The setting is saved in the non-volatile memory and set at the next power-on.

Example: to save the settings, send the following characters on line: 53 0D
The DVIDEC100 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

8.9 Recall settings

The host must send the following sequence
R followed by **CR** where R is the hex character 52
The setting saved previously is restored

Example: to recall the setting saved, send the following characters on line: 52 0D
The DVIDEC100 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

8.10 Restore of default settings

This command restores the factory settings of the parameters described previously for the "Save Settings" command.
The host must send the following sequence

Z	followed by **CR**	where Z is the hex character 5A

E.g. to restore the factory settings, send the following characters on line: 5A 0D
The DVIDEC100 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) in the case of transmission errors

8.11 Machine status request

The host must send the following sequence

D	followed by **CR**	where D is the hex character 44

The DVIDEC100 scaler replies:

D	hex character 44	
AA	number of the input selected	from 01 to 13
B	resolution of the output	from 1 to 7
CC	setting of *brightness*	from 00 to 48
DD	setting of *contrast*	from 00 to 48
EE	setting of *saturation*	from 00 to 48
F	setting of *sharpness*	0 or 1
S	setting of YPbPr	0 or 1
L	mute status	0 or 1
P	enabling of IR receiver	0 or 1
W	autoswitch status	0 or 1
Q	autosequencing status	0 or 1
CR	hex character 0D	

The meaning of the parameters sent by the DVIDEC100 is the same as that of the related commands.

8.12 Firmware identifier request

The host must send the following sequence

i	followed by **CR**	where i is the hex character 69

The DVISEL403 scaler replies:

i	hex character 69
X	DVIDEC100 identifier (hex character 58)
x	identifier of the firmware version (from 0 to 9)
CR	hex character 0D

Example: the reply 69 58 30 0D indicates that the version loaded is 0.

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8.13 Setting of image quality adjustment parameters

This category of commands includes all possible quality regulations of the image on the *High Resolution OUT* output. The same regulations are permitted by the menus on OSD by IR Control.

8.13.1 Setting of brightness

The host must send the following sequence:

YBXX followed by **CR** where YB are the pair of hex characters 59 42
XX indicates brightness value to be set (from 00 to 48)

Example: to set brightness to 28, the following characters must be sent on line: 59 42 32 38 0D

The DVIDEC100 scaler replies:

ACK (Hex 06) if the command has been performed correctly

NACK (Hex 15) if transmission errors have occurred

8.13.2 Setting of contrast

The host must send the following sequence:

YCXX followed by **CR** where YC are the pair of hex characters 59 43
XX indicates the contrast value to be set (from 00 to 48)

Example: to set the color value to 28, the following characters must be sent on line: 59 43 32 38 0D

The DVIDEC100 scaler replies:

ACK (Hex 06) if the command has been performed correctly

NACK (Hex 15) if transmission errors have occurred

8.13.3 Setting of saturation

The host must send the following sequence:

YSXX followed by **CR** where YS are the pair of hex characters 59 53
XX indicates the color value to be set (from 00 to 48)

Example: to set the saturation value to 28, the following characters must be sent on line: 59 53 32 38 0D

The DVIDEC100 scaler replies:

ACK (Hex 06) if the command has been performed correctly

NACK (Hex 15) if transmission errors have occurred

8.13.4 Setting of sharpness

The host must send the following sequence:

YHXX followed by **CR** where YH are the pair of hex characters 59 48
XX indicates the level of sharpness to be set (0 o 1)

Example: to set the sharpness function active the following characters must be sent on line: 59 48 31 0D

The DVIDEC100 scaler replies:

ACK (Hex 06) if the command has been performed correctly

NACK (Hex 15) if transmission errors have occurred

8.14 Setting of image regulation parameters

This category of commands includes all possible adjustments for positioning and adaptation to the destination of the image on the *High Resolution OUT* output. These are the same adjustments as those included in the menus on OSD.

8.14.1 Setting of Horizontal Position

The host must send the following sequence:

HXYY followed by **CR** where H is the hex character 48
X indicates the direction of the shift:
+ or – that correspond to the hex characters 2B or 2D
YY indicates the width of the shift (from 00 a 48 steps)

Example: to set 4-step wide positive horizontal shift , the following characters must be sent on line: 48 2B 30 34 0D

The DVIDEC100 scaler replies:

ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

8.14.2 Setting of Vertical Position

The host must send the following sequence:

VXYY followed by **CR** where V is the hex character 56
X indicates the direction of the shift:
+ or – that correspond to the hex characters 2B or 2D
YY indicates the width of the shift (from 00 a 48 steps)

Example: to set a 4-step wide positive vertical shift , the following characters must be sent on line: 56 2B 30 34 0D

The DVIDEC100 scaler replies:

ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

8.14.3 Fine adjustment of RGB output frequency

The host must send the following sequence:

TXYY followed by **CR** where T is the hex character 54
X indicates the direction of the shift :
+ or – that correspond to the hex characters 2B or 2D
YY indicates the extent of the shift (from 00 to 48 units)

Example: to set 4-unit wide positive frequency shift , the following characters must be sent on line: 54 2B 30 34 0D

The DVIDEC100 scaler replies:

ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have occurred

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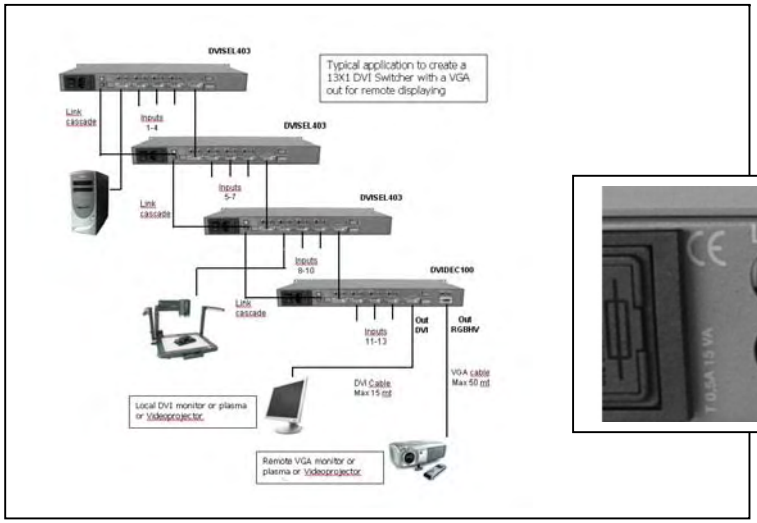
9.0 CASCADE

Compatibly with source signal quality, several DVISEL403 switchers followed by a DVIDEC100 can be connected in cascade to obtain a switcher of up to a maximum of 13 inputs. A VGA switcher, type TZW403/803 can be inserted after the DVIDEC100: in this way, a mixed DVI+VGA switcher is obtained using the VGA output of the last TZW403/803 of the cascade.
The output of each unit must always be connected to input 1 of the next unit. The last unit will be connected to the destination. Synchronization between the units is assured connecting the RCA connectors called LINK located on the back using a terminated cable. Cascade type functioning is activated operating on the 6-pin dip-switch on the back. Make the following settings:

- **Dip 1=ON** enabling of cascade mode
- **Dip 6=ON** compatibility with VGA switcher type TZW/R (only for DVIDEC100)
  =OFF only DVISEL403 and/or DVIDEC100 in cascade
- **Dip 2=ON** and **3, 4, 5=OFF** 1st machine of the cascade (inputs 1÷4)
- **Dip 3=ON** and **2, 4, 5=OFF** 2nd machine of the cascade (inputs 5÷7)
- **Dip 4=ON** and **2, 3, 5=OFF** 3rd machine of the cascade (inputs 8÷10)
- **Dip 5=ON** and **2, 3, 4=OFF** 4th machine of the cascade (inputs 11÷13)

ATTENTION
Switch ON all the units simultaneously or from the last to the 1° in sequence

To control the entire cascade via RS232, connect the serial link of the PC to the RS232 connector of the 1st machine of the cascade (inputs 1÷4)



10.0 TECHNICAL DATA

VIDEO:

Inputs:	:No. 4 DVI-D inputs
Output :	:No. 1 DVI-D output
Output	:No. 1 High resolution with HDD15p.f.
RGB Output Format	:Selectable SVGA, XGA, SXGA and HDTV 480p, 576p, 720p, 1080p
Switching	:Through Blank on DVI Output Seamless with fading on RGB Output
DVI Driving Capability:	:up to 15m in input and output
Synch. level	:TTL
Vertical synch.	:60Hz on RGB Output
Remote control	:RS232 and IR

AUDIO:

Inputs	:No. 4 with RCA outlet
Input coupling	:AC, unbalanced
Input impedance	:56KΩ
Input level	:+9 dBm Max.
Frequency response	:-1 dB from 40Hz to 20KHz
Crosstalk	:60 dB at 5KHz
Distortion	:<0,03% at 0 dBm with 10KΩ load
Hum & noise	:-75 dBm unweighted
Outputs	:No. 1 Unbalanced, 150Ω, with RCA outlet No. 1 Balanced, 600Ω, with Phoenix screw type

Main input	:90÷240 Vac 50-60Hz
Power consumption	:10VA
Size (WxDxH)	:483x210x44
Weight	: 3Kg
Operating temp.range	:0÷45°
Safety	:according to EN60065
EMC	:according to EN55103-1 and EN55103-2

CE Mark

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11.0 NOTES

This product is warranted for 2 years from the date of purchase.

If the fault in the product is due to improper use or operations carried out by third parties, the warranty is forfeited.

During the warranty period, Elpro will repair the faulty units free of charge.

The faulty units must be sent CARRIAGE FREE to the Elpro offices in Turin with a regular accompanying note.

The units repaired will be returned CARRIAGE FORWARD to the addressee.

Outside the warranty period, Elpro will repair the faulty units EX its Turin offices, charging the cost of the repair to the customer.

For any problems during installation of the DVIDEC100
call the Elpro hot-line 011 9348778
or e-mail: info@elprovideolabs.com

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